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Traditional ecological knowledge and biodiversity: Analysis of China and Zambia

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Abstract
This research focuses on the use of Traditional Ecological Knowledge (TEK) in Zambia and China. Ethic groups in both countries have for centuries passed down knowledge of techniques used in environmental conservation. The purpose of this research is to also analyze the backbone of environmental law in both countries, thereby highlighting how these laws work to preserve natural resources and simultaneously place significance on the use of TEK to promote environmental conservation. Furthermore, this research will scrutinize how Zambia and China protect the rights that local/indigenous communities have to these resources. Findings in this research show that TEK can aid environmental law in providing an effective, efficient and ecologically friendly way to access and utilize natural resources. Thus, ensuring that future generations are not robbed of the privilege to enjoy the benefits and sustenance derived from the environment and the various forms of natural resources that we enjoy at present.

Keywords: environmental law, traditional knowledge, traditional ecological knowledge, biological diversity, indigenous communities

Introduction
Traditional Ecological Knowledge (TEK) is the accumulation of knowledge by traditional or indigenous communities which consists of practices and beliefs about the relationship humans have with the environment. This knowledge passed down through generations not only embodies the lifestyle and norms of a group of people, but is also used to maintain their livelihoods. This knowledge includes the relationships between people, plants, animals, natural phenomena, landscapes and timing of events for activities such as hunting, fishing, trapping, agriculture, and forestry (National Park Service 2020). The specific origin of this term is not known, although traditional ecological knowledge can be regarded as an extension of the term traditional knowledge (Eun-Ji, Anila & Steven 2017). Whereas the term traditional knowledge as defined according to WIPO is knowledge, know-how, skills and practices that are developed, sustained and passed on from generation to generation within a community, often forming part of its cultural or spiritual identity. Traditional knowledge originates from local or indigenous communities. Local communities refer to a group of people who aren't necessarily indigenous yet maintain a traditional lifestyle. An example of this is the communities in African countries. While the term indigenous refers to a group of people or their descendants who were at some point colonized by European countries and are the minority population in that country (Gebru 2017). Indigenous communities share a common culture, tradition or sense of kinship. Another international body that recognizes the important role that traditional knowledge plays is the Convention on Biological Diversity (CBD). Accordingly, Article 8(j) of the CBD explicitly lays out what traditional knowledge is comprised of. The scope of traditional knowledge in Article 8(j) includes innovations and practices of indigenous or local communities around the world. It further explains that traditional knowledge encompasses fields such as agriculture, fisheries, health, horticulture and ecological or environmental management.

Rights of Traditional Communities
Agenda 21 is one of the 3 non-binding environmental agreements signed at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992. It places a significant importance on local governments and intergovernmental organizations to respect, record and work toward incorporating indigenous knowledge systems into research and development programs for the conservation of biodiversity and sustainability of agricultural and natural resource management systems. In China, several individuals and organizations have presented their efforts to develop a methodology to document and register traditional knowledge. China's commitment to preserving and upholding traditional knowledge involves developing a formal register for farmer plant varieties, holding seminars and activities that aim to educate scientists about respecting and protecting traditional knowledge. This also includes fostering access and benefit sharing to genetic resources. China also has legislative measures in place for benefits arising from the utilization of

traditional knowledge associated with genetic resources. In Zambia, several laws stipulate that traditional knowledge be used in conservation of certain land areas or used in animal protection. Furthermore, in Zambia the National Agricultural and Co-operatives Policy (NAP) and the National Policy on Indigenous Knowledge, Genetic Resources and Folklore have incorporated promotion and conservation of traditional crop varieties and livestock breeds. Additionally, the rights that Zambian traditional communities have extend to governing both biological and genetic resources within their areas. Customary law gives locals the right to manage as they see fit protected areas such as game reserves/parks, In-situ conservation areas and agricultural landscapes. Game Management Areas (GMAs) are areas in traditionally owned lands (under the leading of a Chief or Headman). These areas are mainly used for the protection of Wildlife, especially endangered species. Zambia's National Biodiversity Strategy and Action Plan (NBSAP-2) identifies the Ministry of Chiefs and Traditional Affairs as the primary stakeholders in the protection of biodiversity. Zambia continues to improve measures in place for rural communities to participate all the more in the conservation of biodiversity. The Simalaha Community Conservancy in Mwandi District which is located in Western Province is one of the initiatives taken by government to incorporate traditional ecological knowledge in Biodiversity conservation.

Primary Sources of Environmental Laws

In an overall picture, the legislative techniques of the legal system practiced in China are mostly modeled on European Continental Civil Law and blended in with Chinese characteristics. While Zambia's legal system is that predominantly of Common Law and Customary Law. In China, the Constitution is of central importance having the most significant effect on the entirety of the legal system (Rou 1989). The Constitution was first adopted in 1982. Further amendments were made through 1983, 1988, 1999 and 2004. In accordance with the provisions of Article 2 to the Constitution, all power belongs to the people. This authority is manifested through the National People's Congress (NPC) and local people's congresses. The Constitution enables for the government to run smoothly through the Standing Committee of the NPC (SCNPC). It also gives the SCNPC authority for interpretation of the Constitution and the formation or revision of laws. This authority also extends to the environmental arena. The SCNPC and the Environment and Natural Resource Protection Committee of the NPC are involved in matters concerning making, revising and interpreting environmental statutes. They also conduct environmental audits and oversee the work of environmental protection agencies and courts.

In regards to Zambia, following her independence in 1964, Zambia drew up its first Constitution and simultaneously held the national elections that followed suit in 1973 (Magagula 2009) [7]. In 1991, the new Constitution paved way for a multiparty system. Zambia's Constitution has all its laws put together in a single document. The Constitution has precedence over all other laws, thus making other laws applicable only to the extent that they are in tandem with its provisions. The Zambian Constitution addresses subjects of Natural Resources, Protection of environment, Polluter pays principle, Pollution control, Agricultural land and Rights to water among other things. Given that the Constitution makes provision for the independence of the Judiciary, the government uphold this fact. The Constitution also gives recognition to Customary law in Part XIII, which elaborates on the authority of local Chiefs in dealing with matters related to customary law. Article 23 of the Constitution also provides for a guarantee of equality and fair treatment under the law for differentiated results of the various forms of customary law.

Judicial Aspect of Environmental Law

China's Judiciary is responsible for dealing with prosecuted cases brought forth in accordance with the law by its organs and their personnel. This system is made up of the People's Courts, the Supreme People's Court, the People's Procuratorates, the Supreme People's Procuratorate, Military Procuratorates and other Special People's Procuratorates. When it comes to the area of environmental law, the Supreme People's Court heads the facilitation of judicial interpretation pertaining to environmental legal concepts and principles. It also supervises in the administration of vital environmental law cases handled by lower-level courts. Furthermore, China has more than 50 environmental courts, environmental tribunals and environmental collegiate panels spread out across the country and delegated to addressing environmental public interest litigation, environmental disputes and reviewing decisions of environmental protection agencies (Liu 2013) [6].

First and foremost, it should be noted that Zambia's judiciary holds and enjoys the status of constitutional autonomy. Zambia's judicial system is intertwined with aspects of English Common Law and Customary Law. The Supreme Court being the highest court serves as the final court of appeal. Zambia in addition has several High Courts located in the provincial capitals which exercise Common law when deliberating criminal and civil cases, as well as appeals from lower courts. It also has Resident Magistrate Courts in a number of centers in which trials are open for public audience. There are more than 464 local court which administer Customary Law in areas concerning marriage, property and inheritance, while the subordinate courts are located in every district. In Zambia, the legislature is for all intents and purposes the law-making body, while the judiciary is tasked with interpretation of the law. These bodies are two very distinct entities. Whereas in China the two institutions are linked. When it comes to matters concerning the protection of the environment, Zambia has several places from which legislation around this area is dealt with. To mention but a few, these are the Constitution, Environmental Management Act, Zambia Wildlife (International Trade in Endangered Species of Wild Fauna and Flora) Regulations which deals directly with matters around Plant Genetic Resources such as Plant production, Wild fauna and flora and Wildlife products.

Practices of Traditional Ecological Knowledge

Zambia

Although English is the official language spoken in Zambia, but like other African countries, there are several other languages spoken by the local inhabitants. The total number of which are 73, encompassing different tribal groups. All of whose ethnic and cultural diversity continue to play an important role in the development and perpetuation of various natural resources. Therefore, due to one reason or another, certain crop species and varieties are associated with particular groups of people. The Ngoni and Chewa ethnic groups in Zambia possess traditional knowledge of pests that affect their crops and alternative approaches to their control (Nyirenda, Sileshi & Belmain 2011). A study carried out showed that their traditional ecological knowledge enabled them to identify priority pest problems in *crucifers* (brassica) and tomato crops. Some common pests in these plant species are the red spider mite (Tetranychusevansi), bollworms (Helicorvepaarmigera) and aphids. Other troubling pests of tomatoes included red ants, blister beetles and leaf-miners. The main pests reported on crucifers were aphids (Brevicorynebrassicae), diamond back moths (Plutellaxylostella), cutworms (Agrotis spp.), webworms (Hellulaundalis), grasshoppers and beetles. The farmers were able to employ an inexpensive use of vegetable pest management and utilized plants which have naturally occurring pesticide like effects to combat the pest problem. The plants used were Tephrosiavogelii, neem (Azadirachtaindica), Mucunapruriens, Bobgunnia (Swartzia) madagascarensis, Euphorbia tirucali, Vernoniaamygdalina, Tithoniadiversifolia, Solanumpanduriforme and tobacco (Nicotianatabacum). Such knowledge is necessary to prevent farmers (especially those with limited funds to purchase appropriate pesticides) from using unsafe pesticides which are high in toxins and cause harm to humans, livestock and the environment. Another example of TEK is among the Lozi speaking people. This form of traditional knowledge is very common and highly practiced. It includes taboos, myths and restrictions associated with the sustainable use of natural resources. They center around restrictions that forbid cutting down of trees on shrines and river catchment areas. They also place restrictions on the time and area of harvesting natural resources. This approach helps alleviate the depletion of plant or forest genetic resources and also protects habitats during the rebuilding phase of a resource **(**Milupi, Moonga & Chileshe 2020) [8].

China

China consists of 56 diverse ethnic groups whose customs and traditional knowledge play a vital role in its biodiversity. Ethnic people in Southwest China have played a key part in the preservation of landscape by means of knowledge that has been handed down from generation to generation. This knowledge centers on religious beliefs, hunting taboos and the protection of sacred sites. Furthermore, their traditional knowledge places a high value on protecting forests, landscapes, water catchments and the preservation of biodiversity. As a contracting party to the Convention on Biological Diversity, China has made active efforts to protect and record traditional knowledge associated with biodiversity and biological resources over the past two decades. Additionally, The Chinese government through the enactment of the Organic Law of 1998 show that they have a particular desire to promote and incorporate traditional knowledge into environmental protection. This law grants villages the legal right to self-government and gives indigenous communities greater responsibility for land and resource use. In Ningxia Hui which is an autonomous region located in China, the local farmers and herdsmen practice traditional knowledge of forage plants and animal husbandry techniques which originate from their livelihoods and cultures (Ying, Binsheng & Qiang 2019). The TEK employed by locals aids in the conservation of wild forage plant resources through their efficient techniques for utilization, classification and preservation of forage plant resources. Furthermore, some of these regions have climates that are not conducive for agricultural activities or animal rearing. But the traditional knowledge of locals enables them to make the most of out of the limited resources at hand and not sustain their livelihoods at the expense of the environment. The plant families used by locals included more than 10 traditional forage plant species. Such as: *leguminosae, compositae* and *gramineae*. From some traditional forage plants, of the 213 species available, locals used stems and leaves the most for livestock feed and among them 39 species of flowers and fruit were also used for livestock feed. Locals also used 11 different species of which only the roots, flowers and seeds could be used for livestock feed. Forage plants alos have their own distinct and unique characteristics. For example, in three species known as *Schisandra chinensis, Sophora alopecuroides, and Eruca vesicaria,* only the fruit was used as livestock feed. The fruit of the *Schisandra chinensis* was also used as a as medicine. This not only indicates the diverse usage of forage plant resources, but further shows how this traditional ecological knowledge plays an important role in biodiversity protection.

Conclusion

With a combination of the unsustainable management of resources, the rate of environmental degradation at an alarming high and a threatening increase of the triple planetary crisis of climate change, biodiversity loss, and pollution. It is now more imperative than ever that the world turns to new methods of environmental protection. Local and indigenous peoples around the world have lived in a beautiful and harmonic balance with nature for thousands of years. According to recent studies, although environmental decline also occurs in indigenous communities, compared to areas in the rest of the world this decline is substantially lower. Expert analysis concludes that this is mainly as a result of traditional knowledge. A report made in 2019 by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) found that

indigenous communities have a far better chance than scientists to provide vital information on biodiversity issues and environmental changes. This is mainly because they are more aware of their environment and easily identify negative changes once they occur. Furthermore, their cultural practices which promote balance of nature and It's restoration. The participation of traditional communities and indigenous groups of people plays an important part in identifying specific biological resources and their use. The traditional knowledge of these groups also aids in the conservation of such resources. Traditional knowledge comes in a variety of forms, this includes traditional medicinal knowledge (TMK), traditional agricultural knowledge (TAK) and traditional ecological knowledge (TEK). The global community is increasingly seeing the value and untapped potential that TEK Posses in sustainably conserving scarce natural resources. TEK is not only affordable, but offers practical solutions to current environmental dilemmas such as the depletion of natural resources. Both Zambia and China need to develop new systems catered specifically for the protection and promotion of traditional ecological knowledge. For example, introducing a Sui generis system that would allow for identifying the various forms of traditional knowledge held by locals, clear procedures for Prior Informed Consent and Mutually Agreed Terms once TEK is utilized by non-members.

References

1. African Law Information Institute. "Zambia: Environmental Law Context, 2019. Report". https://africanlii.org/book/zambia-environmental-law-context-report (Accessed January 11th 2022)
2. Chisompola Lois. "Zambia: Environmental Law. Context Report". PhD diss., University of Cape Town, South Africa, 2019. https://africanlii.org/book/zambia-environmental-law-context-report_(Accessed 22nd April 2022)
3. Convention on Biological Diversity. "Analysis of Information Contained In the Interim National Reports and Information". Access and Benefit-Sharing Clearing House. Item 4 of the provisional agenda, 2019, 34. https://www.cbd.int/doc/c/767b/a3b0/e4934613a1a3fd1116b1c89a/sbi-02-inf-03-en.pdf (Accessed 10th April 2022)
4. Eun-Ji Amy Kim, Anila, Asghar, Steven, Jordan. "A Critical Review of Traditional Ecological Knowledge (TEK) in Science Education". Canadian Journal of Science, Mathematics and Technology Education, 2019, 2. DOI:10.1080/14926156.2017.1380866
5. Gebru Aman. "Intellectual Property, Traditional Knowledge and Bioprospecting: Searching for Efficient Balance of Rights". PhD diss., University of Toronto, Canada, 2017, 16
6. Liu Jing Jing. "Overview of the Chinese Legal System". Environmental Law Institute. 1(1)3-5. ISSN 2153-1420.
7. Magagula S Alfred. "The Law and Legal research in Zambia", 2019. https://www.nyulawglobal.org/globalex/Zambia.html (Accessed 27th January 2022)
8. Milupi Inonge, Moonga Sampa Mirriam, Chileshe Bernard. "Traditional Ecological Knowledge and Sustainable Practices Among The Lozi Speaking People of Zambia". Multidisciplinary Journal of Language and Social Sciences Education,2020:3(1):32-36 https://www.researchgate.net/publication/338409431_Traditional_Ecological_Knowledge_and_Sustainable_Practices_among_the_Lozi-speaking_people_of_Zambia
9. Nyirenda P Stephan, Sileshi W Gudeta, Belmain R Steven. "Farmers' Ethno-ecological Knowledge of Vegetable Pests and Pesticidal Plant Use in Malawi and Zambia". African Journal of Agricultural Research,2011:6(6):1529-1536
10. http://www.projects.nri.org/adappt/docs/Nyirenda.pdf
11. National Park Service. "Traditional Ecological Knowledge". U.S Department of the Interior, 2021. https://www.nps.gov/subjects/tek/description.htm#:~:text=Traditional%20Ecological%20Knowledge%20%28TEK%29%20is%20the%20on-going%20accumulation,down%20through%20generations%2C%20and%20used%20for%20life-sustaining%20ways (Accessed 16th 2022)
12. United Nations Climate Change. "What is the Triple Planetary Crisis?" https://unfccc.int/blog/what-is-the-triple-planetary-crisis (Accessed 28th April), 2022.
13. United Nations Environment Programme. "How Indigenous Knowledge Can Help Prevent Environmental Crises", 2021. https://www.unep.org/news-and-stories/story/how-indigenous-knowledge-can-help-prevent-environmental-crises (Accessed 28th April 2022)
14. Rou Tong. "The General Principles of Civil Law of the PRC: Its Birth, Characteristics and Role". Law And Contemporary Problems,1989:52(2):151
15. Xue Da Yuan. "Establishment of a National System of Access and Benefit Sharing for Genetic Resources and Associated Traditional Knowledge". Written on Occasion of the Entry into Force of the Nagoya Protocol. Editorial Board of Biodiversity,2019:(5):547-548.
16. https://www.biodiversity-science.net/CN/lexeme/showArticleByLexeme.do?articleID=8806
17. (Accessed 8th April 2022) - Original Text: 薛达元. 建立遗传资源及相关传统知识获取与惠益分享国家制度: 写在《名古屋议定书》生效之际. 版权所有《生物多样性》编辑部,2014:(5):547-548

18. Ying Ma, Binsheng Luo, Qiang Zhu. “Changes in Traditional Ecological Knowledge of Forage Plants in Immigrant Villages of Ningxia, China”. Journal of Ethnobiology and Ethnomedicine,2019:15(65):2-6